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MICROWAVE

LTE

Wi-Fi

IoT

5G

CREATIVE & UNIQUE

Taurus
MY1525
MICRONIX

MAT800 FAST PROGRAMMABLE ATTENUATOR
PRGM 10kHz L:131072
P:6.5535s FREE 30µs
ATTEN MODE
ATTEN
FILTER
READ CLOCK
PRGM LENGTH
PAUSE TIME
READ MODE
SET UP
ENTER
POWER
ON
OFF
READ CLOCK IN
TRIG IN
SYNC OUT
ATTEN IN
ATTEN OUT
TTL
0.8Wav 20Wpk MAX
MICRONIX

Handover tester
MH3800

Outline

The MH3800 is a total system that can easily perform handover (handoff) evaluation of wireless communication equipment and actual operation test of "fallback (reduction of transmission speed)" due to distance attenuation in actual environment.

The handover means that a mobile station such as mobile phone and wireless LAN terminal switches a base station or access point communicating with it to another one while moving. In cellular phone and wireless LAN adopting the cell system, if the radio wave from the base station or access point weakens when the terminal moves to the cell boundary or due to other reasons, the communication won't be performed as it is. Therefore, when the radio wave weakens, the communication target is switched to a base station or access point with strong radio wave which is another cell.

The radio wave of wireless communication changes variously while it passes through air. It is necessary to carefully consider whether the wireless communication device operates correctly or how it behaves in response to that change. The MH 3800 is a system that combines high-speed programmable attenuator MAT 800/810, anechoic box and attenuation data creation & control software, and is the optimal configuration to simulate the change of radio wave in air.

This system leads to quantifying the test environment, long run (aging) test and reduction of the verification time by automating the test.
The test system enables 8 paths as standard and maximum 64 paths (controls 64 units of MAT 800/810 at once).

Expected tests and benefits

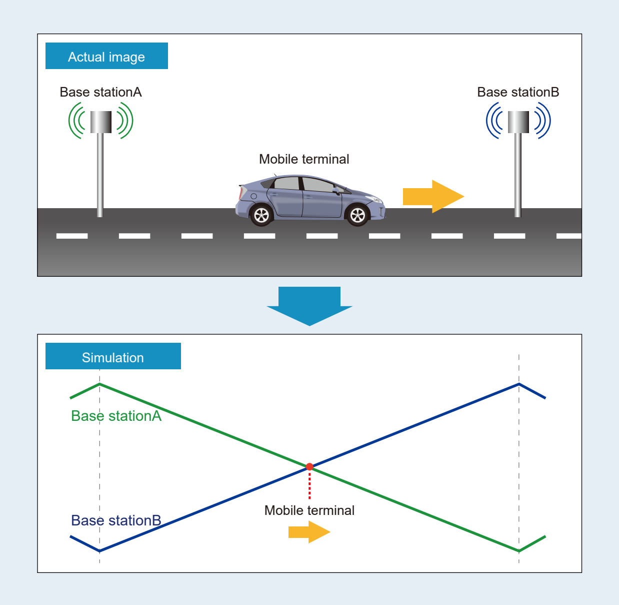
■Handover (handoff) evaluation
The strength of the radio wave when the mobile terminal moves closer or farther towards multiple base stations or access points can be simulated, and then the handover is caused. The attenuation scenario can be synchronously controlled up to 64 channels.

■Fallback operation test (decrease in transmission speed)
The attenuation amount according to the distance to the cell can be switched continuously and without 1/4 interruption. The high-speed programmable attenuator MAT 800/810 is an electronic variable attenuator and has a very fast switching speed of 2 μs. Therefore it can simulate the transient phenomena such as shadowing.

■Long-run (aging) test
By automating the repetitive tests in the same scenario, the efficiency and time of test will be improved. A continuous durability test in day and night can be also done by uninhabited.

■High versatile and scalable system
If it is used within the frequency range from 300 MHz to 12.5 GHz, there is no need to worry about communication standards. The equipment doesn' t become obsolete, and also is excellent in versatility and scalability.
※The frequency range depends on which of the six models of MAT 800 A / B / C / D / E and MAT 810 is used.

■Simple scenario creation and control
The attenuation data creation & control software MAS 801 enables to create and control scenarios with intuitive operation. Moreover, the attenuation data during executing scenario can be monitored.



It simulates the attenuation process of radio wave in which the communication of mobile terminal transfers from base station A to base station B.
Since MH3800 only simulates the communication environment, the evaluation of actual communication quality such as throughput measurement and packet capture needs an evaluation software such as iperf and Wireshark.

■About high-speed programmable attenuator MAT 800/810
This doesn't generate chattering or spikes when switching attenuator because of an electronic variable attenuator unlike a general mechanical attenuator.
Seamless and continuous attenuation without instantaneous interruption can be obtained, and fine attenuation step (0.05 dB minimum) can be set, so that highly accurate wireless simulation is possible.

■About anechoic box (shield box)
This blocks radio waves flying around and also does not leak radio waves emitted in the box to outside.
OTA (Over-The-Air) performance test can be accomplished correctly in a stable environment without interference waves.

Target market

■Keywords
Cellular phone (2G, GSM, 3G, CDMA, 4G, LTE, WiMAX, 5G and etc.), Wireless LAN, Bluetooth, Zigbee, NFC, RFID, Wi-SUN, UWB, ETC 2.0, DSRC, M2M, Sensor, Wearable, Satellite communication and etc.

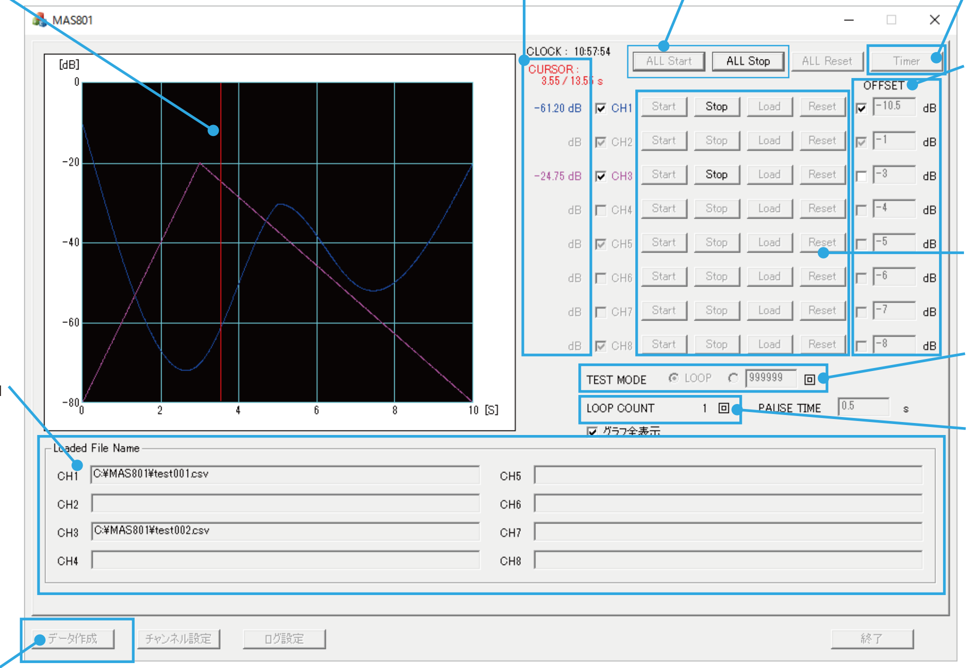
■Applied frequency
300MHz to 12.5GHz (depend on the model of programmable attenuator)

Communication element technology R&D, Wireless module development & manufacturing, Finished product quality evaluation, Interoperability verification.

Attenuation data creation & control software

Main screen

The scenario is read out and executed.


MAS801
[dB]
0
-20
-40
-60
-80
0
2
4
6
8
10 [S]
ALL Start
ALL Stop
ALL Reset
Timer
OFFSET
Start
Stop
Load
Reset
CH1
CH2
CH3
CH4
CH5
CH6
CH7
CH8
Loaded File Name
データ作成
チャンネル設定
ログ設定
終了

CLOCK : 10:57:54
CURSOR : 3.55 / 13.55 s

-61.20 dB	☑ CH1	☑	-10.5 dB
dB	☑ CH2	☑	-1 dB
-24.75 dB	☑ CH3	☐	-3 dB
dB	☐ CH4	☐	-4 dB
dB	☑ CH5	☐	-5 dB
dB	☐ CH6	☐	-6 dB
dB	☐ CH7	☐	-7 dB
dB	☑ CH8	☐	-8 dB

TEST MODE ● LOOP ○ 999999
LOOP COUNT 1
PAUSE TIME 0.5 s
☑ グラフ全表示

CH1 C:¥MAS801¥test001.csv
CH2
CH3 C:¥MAS801¥test002.csv
CH4
CH5
CH6
CH7
CH8

The scenario loaded is displayed as graph.
During execution, the cursor is displayed
and moves according to the execution time.

Time and attenuation
at the cursor position
are displayed.

Control all channels
that can be started or stopped
in one lump-sum.（※）

Setting the start and end times
of the scenario.

Input the offset value
(reflected in graph and
attenuation amount).

Only the selected
channel can be
individually operated.

Select either continuous
operation or operation
by the specified number
of times of the scenario.

Number of executions
of scenario

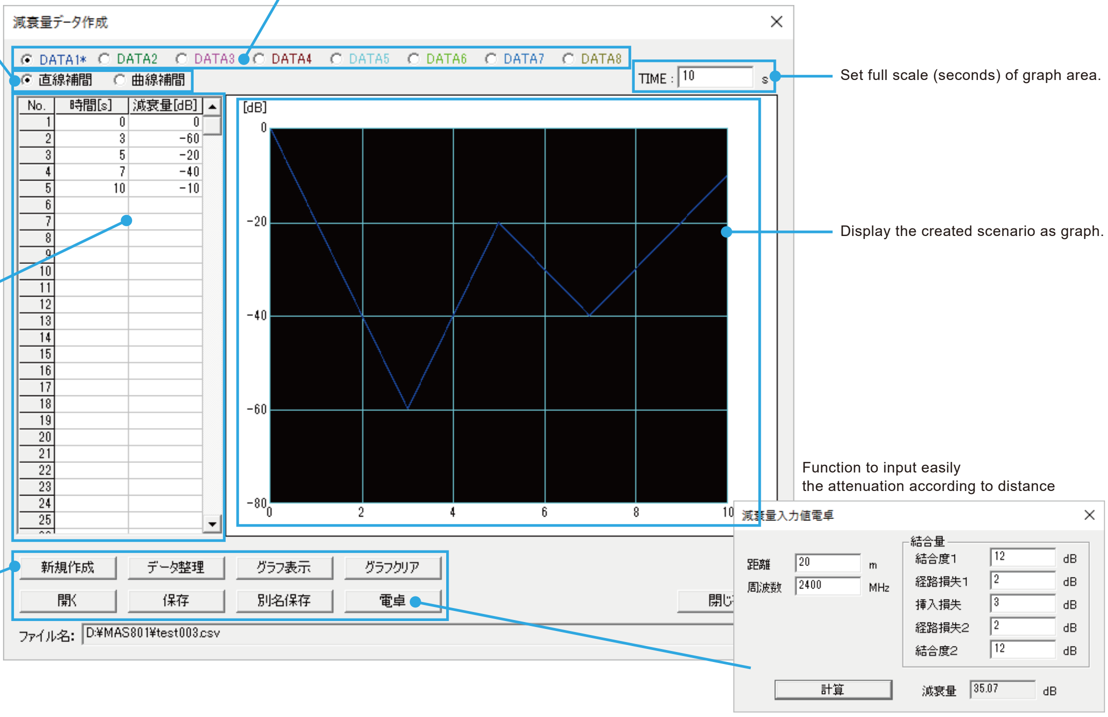
Display the full path
name of attenuation
data of each channel
loaded.

To attenuation data creation screen

※If the attenuation data has not been downloaded to the attenuator itself,
the scenario will start after downloading.

Attenuation data creation screen

Set time and attenuation, and create a scenario.


減衰量データ作成
[dB]
0
-20
-40
-60
-80
0
2
4
6
8
10
新規作成
データ整理
グラフ表示
グラフクリア
開く
保存
別名保存
電卓
閉じ
減衰量入力値電卓
計算

● DATA1* ○ DATA2 ○ DATA3 ○ DATA4 ○ DATA5 ○ DATA6 ○ DATA7 ○ DATA8
● 直線補間 ○ 曲線補間
TIME : 10 s

No.	時間[s]	減衰量[dB]
1	0	0
2	3	-60
3	5	-20
4	7	-40
5	10	-10
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		

ファイル名: D:¥MAS801¥test003.csv

距離 20 m
周波数 2400 MHz

結合量
結合度1 12 dB
経路損失1 2 dB
挿入損失 3 dB
経路損失2 2 dB
結合度2 12 dB

減衰量 35.07 dB

Select either "straight line" or "curve"
as the method of interpolation connecting
between points.

Switch to channel to edit.

Set full scale (seconds) of graph area.

Display the created scenario as graph.

Scenario creation area

Function to input easily
the attenuation according to distance

Menu such
as data creation,
storage and display

Product Lineup

High-speed programmable attenuator

Model	Frequency range	Maximum attenuation	Maximum input
MAT800A	1.5 to 4.5GHz	80dB	100mW (+20dBm) ※P1dB
MAT800B	3.0 to 9.0GHz		
MAT800C	4.5 to 12.5GHz		
MAT800D	1.95 to 5.85GHz		
MAT800E	0.75 to 2.25GHz		
MAT810	0.3 to 6.6GHz	60dB	25mW (+14dBm) ※P2dB

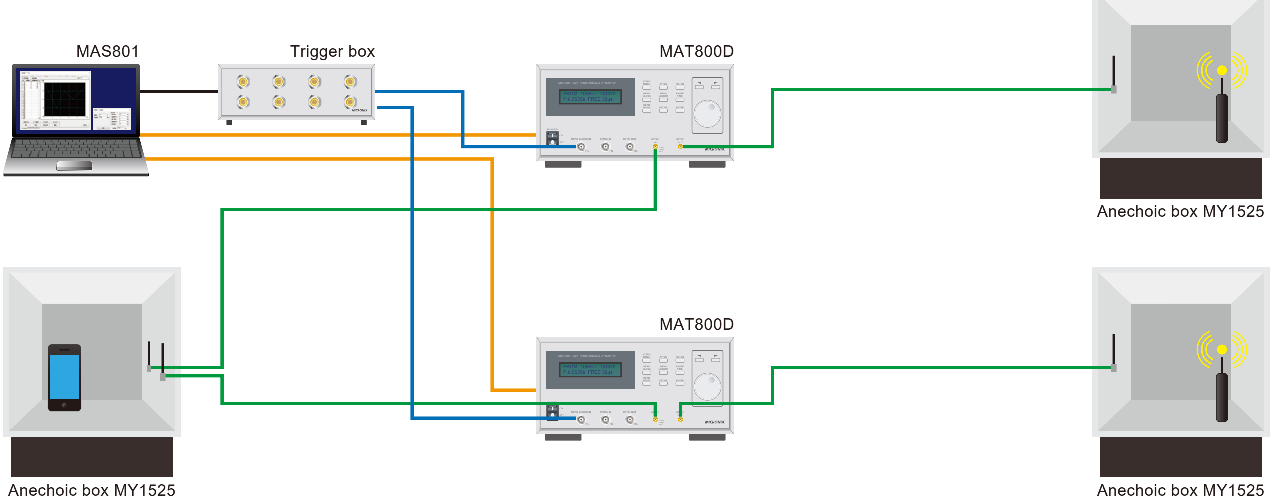
Anechoic box

Model	Outside dimensions (W,H,D mm)	Inside dimensions (W,H,D mm)	Shielding characteristics	Remarks
MY1510	380×165×380	315×100×315	70dB typ@2.4GHz	
MY1515	465×214×465	400×150×400	70dB typ@2.4GHz	with fan
MY1520	520×520×520	460×460×460	70dB typ@2.4GHz	
MY1520SW	520×520×520	460×460×460	70dB typ@2.4GHz	with shield window
MY1525	460×570×582	340×340×400	90dB typ@2.4GHz	with fan
MY1530	1120×705×620	1000×500×500	70dB typ@2.4GHz	

※Please contact us for details of specifications.

System configuration example

■ Handover in two paths of the wireless LAN (two access points and one client)



Product name	Model	Quantity
High-speed programmable attenuator	MAT800D	2
Attenuation data creation & control software and Trigger box	MAS801	1
└ BNC cable	MC314-1M	2
└ USB-RS232C cable		2
Anechoic box	MY1525	3
└ IF module	IFM10	3

※This configuration does not include coaxial cable, antenna, PC, access point, client and engineering cost.
※Please contact us for details and combination of the system.
※MICRONIX Corporation reserves the right to make a change in design, specification and other information without prior notice.

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